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CRANBERRY GIRDLER MOTH DAMAGE TO DOUGLAS-FIR SEEDLINGS IN COEUR D'ALENE NURSERY IDAHO PANHANDLE NATIONAL FORESTS 1982

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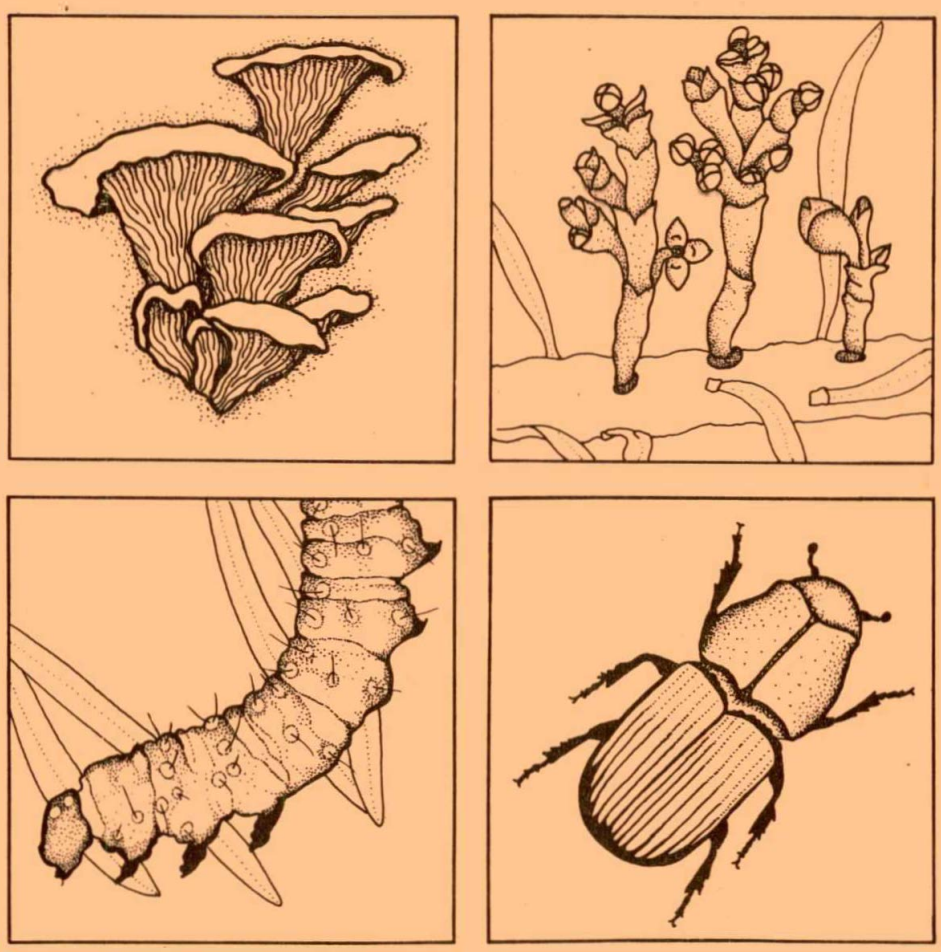

CRANBERRY GIRDLER MOTH DAMAGE TO DOUGLAS-FIR SEEDLINGS IN COEUR D'ALENE NURSERY, IDAHO PANHANDLE NATIONAL FORESTS - 1982

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ABSTRACT

A sod webworm, the cranberry girdler moth, Chrysoteuchia topiaria Zeller, is destroying bark from root collars of 2-0 Douglas-fir seedlings in the Coeur d'Alene Nursery, Idaho. Samples (14,188 seedlings) from 25 Douglas-fir beds showed damage ranging from 0 to 3.8 percent, with an average of 0.9 percent partially or totally girdled. No pines were attacked. No operational control methods are available. Sprays to kill larvae in the soil or flying adult moths are being tested in other nurseries. Population manipulation with pheromones may be feasible to disrupt mating. A population prediction method needs to be developed.

INTRODUCTION

The cranberry girdler moth, Chrysoteuchia topiaria Zeller, which is a sod webworm, has recently been identified as a pest in beds of seedlings at the Coeur d'Alene Nursery near Coeur d'Alene, Idaho. Damage was first noticed in 1980 when many 2-0 Douglas-fir seedlings were damaged just below the root collar. Feeding looked like that caused by rodents or cutworms. Nurserymen in Oregon and Washington had been finding this type of feeding since the late seventies, and in 1979 determined it to be caused by the cranberry girdler. We suspected that this same girdler was causing the damage in the Coeur d'Alene Nursery.

Moths were captured in pheromone-baited sticky traps and identified in 1981 and degree of damage determined in 1982. This report describes events to date and a little about the girdler's life history and habits.

Life History, Habits, and Importance

This sod webworm is an economic pest in commercial grass seed fields that surround the Coeur d'Alene Nursery. The moths are probably drifting into the Nursery from the grassfields, and finding a uniform canopy of seedlings, they deposit their eggs. The larvae then feed on developing seedlings.

The following life history was determined by Kamm and Robinson (1974) for the girdler moth in Oregon and Washington, and is probably the same in northern Idaho. Adults emerge from mid-June into July and these snout moths (mouthparts form a distinct structure which projects from front of head) flit among the seedlings laying eggs. A female can lay up to 500 eggs and probably places them around the root collars. Larvae

enter the soil and feed heavily during late August and September causing injury. During October, feeding stops and larvae prepare to overwinter in hybernacula. Some feeding occurs in the spring before pupation.

Damage generally occurs in scattered patches where almost all seedlings are injured. In severe infestations, losses can exceed 25 percent of seedlings in a bed. Girdler damage is hard to detect until seedlings are lifted. Bark feeding is apparent on the root collar (fig. 1) at or just below ground line. Damage was most severe in nurseries surrounded with grassland/pasture, minor in ones surrounded with farmland or woodlands, and seldom occurred in ones bordered by forest. Most damage occurs in 2-0 beds. Hosts are Douglas-fir, white fir, and noble fir (Triebwasser and Overhulser, 1980).

Figure 1.--Feeding damage on 2-0 Douglas-fir seedling by girdler moth larva.

Methods

To identify the moth, pheromone-baited sticky traps (McDonough and Kamm 1979) were placed in all sections of the Coeur d'Alene Nursery and in surrounding grassfields in June 1981.

Seedlings were inspected for amount of injury during lifting operations in March 1982. Douglas-fir, grand fir, and lodgepole pine 2-0 stock was examined as it was being lifted (fig. 2) in the field and being sorted and culled in the packing shed. Seven samples of culls were also collected a week later by nursery personnel and sent to Missoula for inspection.

Figure 2.--Machine used for lifting Douglas-fir seedlings from beds at Coeur d'Alene nursery.

Twenty-five seedlots of Douglas-fir, one seedlot of lodgepole pine, and one seedlot of grand fir were examined. Samples of from 27 to 1,057 seedlings per lot were collected.

Results

All traps caught male cranberry girdler moths, (range four to 155 moths per trap). They were sent to Dr. Jim A. Kamm, Department of Entomology, Oregon State Univ., Corvallis, Oregon for identification.

No girdler moth damage was found in the lodgepole pine sample and only one out of 27 grand fir seedlings was injured (table 1). In 25 Douglas-fir seedlots damage ranged from 0 to 3.8 percent partially girdled seedlings (table 1). Damage was measured in samples of culls from the packing shed and in samples of seedlings lifted in the field. The 3.8 percent damage was in seedlot 05-4.4-2085M where 11 out of 291 seedlings were injured.

Table 1.--Seedling 2-0 stock from Coeur d'Alene Nursery examined for cranberry girdler moth damage, March 1982.

Seed bed number	Number seedlings examined	Number injured	Percent injured
D-F random sample	1,000	2	0.2
D-F random sample	457	3	0.6
D-F 12-4.5 R4-11	1,057	1	.09
D-F 17-4.4-2517M	1,109	1	.09
D-F 17-5.2-2180M	166	0	0
D-F 17-5.2-2124M	500	0	0
D-F 17-5.2-2089M	500	0	0
D-F 05-4.4-2085M	291	11	3.8
D-F 05-5.0-2452T	1,000	27	2.7
D-F 17-5.1-2738T	556	0	0
D-F 17-5.0-2740M	685	0	0
D-F 05-5.0-2452T	485	7	1.4
D-F 05-4.0-2615T	552	7	1.3
D-F 05-4.0-2615M	500	5	1.0
D-F 17-5.0-1708T	500	1	0.2
D-F 05-5.0-2450M	600	8	1.3
D-F 17-4.6-2724T	677	2	0.3
D-F 05-5.0-2445M	721	2	0.3
D-F 05-4.0-2615T	849	25	2.9
LP 2982T-02-7.0	243	0	0
GF 04-5.0-2284 M	27	1	3.7
D-F 05-4.5-2604M	372	17	4.5
D-F 03-7.0-1139M	341	2	0.5
D-F 14-5.0-2666M	486	6	1.2
D-F 12-6.0-0154M	113	2	1.7
D-F 14-4.6-2355M	201	0	0
D-F 09-6.0-0131T	199	1	0.5
Totals	14,188	131	Average 0.9

An average of 0.9 percent of the 14,188 seedlings examined showed some degree of girdler moth damage.

Control

Kamm and Robinson (1974) stated that insecticides were not effective for controlling the moth in grassfields. Combined mortality caused by birds, disease, and parasites can be about 91 percent of mature larvae in grassfields. Triebwasser and Overhulser (1980) had some encouraging results with Dursban® (chloropyrifos) at 1 lb A.I./acre applied to root collar area of 2-0 seedlings in late July, August, and mid-September. Damage was 7 percent in the check plot and only 0.5 percent in the sprayed plot.

Tests with Diazinon®, Sevin®, and pydrin are underway to kill adult moths (Triebwasser and Overhulser 1980). Results are not conclusive yet. Also being tested is the feasibility of using the sex attractant isolated from the cranberry girdler to disrupt mating. With a very high level of this attractant in a field, the male moths might have difficulty in locating females (Triebwasser and Overhulser 1980).

Discussion

Cranberry girdler moth populations will vary from year to year within the Coeur d'Alene Nursery depending on the level of larval mortality in the surrounding grasslands. Flights of moths may have been heavier in 1980 than in 1981 accounting for damage being more noticeable during the 1980 seedling harvest. However, even if there is a heavy moth flight into the nursery, we can't be sure that they will always be attracted to the seedlings and that they will lay a large complement of eggs. Also, we don't know what constitutes a "heavy" moth population and what degree of damage it might inflict. Obviously, we need a method for predicting damage based on either moth or larval populations.

The pherocon #2 trap, with hood and sticky paper floor, baited with a rubber septa containing female sex attractant, will successfully catch male moths. This may be the tool to measure moth populations for prediction purposes.

Larval populations would have to be sampled in July before heavy feeding commenced. By late summer the damage would have occurred and it would be too late for treatment.

Because larvae in the soil of the seedbeds are difficult to kill, control efforts might have to be directed at the adult moths. Cooperative testing with Dr. George Markin, Pacific Southwest Forest and Range Experiment Station, Davis, California for control of this moth may be feasible if populations become heavy enough in the Coeur d'Alene Nursery.

Cooperative Forestry and Pest Management wants to determine the percent of damage to 2-0 seedlings again when they are being lifted during the fall of 1982 and/or spring of 1983. Weather permitting, the best method

for checking seedlings for injury is to pick samples from the rack of the lifting machine out in the beds. Injured areas are "whiter" and not covered with mud as they are when culled and thrown on the floor of the packing shed. This is not destructive sampling because sound seedlings are returned to the lifter rack.

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